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To: J. W. McCaslin

From: O. L. Cordes

Subject: TAN-SPERT Health Physics Progress Report for September, 1965: Cord-61-65A

b. If report:
Title:

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Monthly Health Physics activity/progress report: preperations for SNAPTRAN-2 test, SPERT area activities, PBF excavation support, general fission gas sampling method and LOFT PSAR review/comment.

6. Name and telephone number of person completing form:	7. Organization:	8. Date:
Burton R Baldwin (208) 525-0203	Lockheed Idaho Technologies Co.	March 14, 1995

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HUMAN RADIATION EXPERIMENTS

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BOX NUMBER	INEL BOX NO. P-24724 FRC NO. 356723 ACCESSION NO. 70 A 1464
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DOE/HRE-ID-040

This is an outstanding report!

PHILLIPS PETROLEUM COMPANY
Atomic Energy Division
Idaho Falls, Idaho

October 13, 1965

TAN-SPERT Health Physics Progress Report for September, 1965
Cord-61-65A

REPOSITORY INEL

COLLECTION SNAPTRAN

BOX No. P-24724 RSR# P-2133
TAN MONTHLY REPORT FOR 1965

FOLDER TAN SPERT H.P. PROGRESS REPORT FOR 9/65

Mr. J. W. McCaslin
O F F I C E

The monthly report of TAN-SPERT Health Physics Section for September, 1965, is as follows:

GENERAL

During this period IDO-17118, "Decontamination Facilities at the Test Area North," was published. This report describes the capabilities of the TSF Decontamination Facility. A wide distribution of this report was made to all site contractors in an effort to familiarize site personnel with the available decontamination services at TAN.

TSF

The major activities requiring HP coverage in the TSF area during September were:

1. PM-2A work in the Hot Shop
2. Fuel transfers in the pool area
3. Coverage of RML and HCA
4. Transfers of contaminated items between the Hot Shop and RPSSA
5. Coverage of fuel transfers from the Aerojet General ML-1 reactor to the TAN-607 pool.

The transfer of the Aerojet General fuel required coverage by two daily shifts for about a week. In addition, the shim liners were received which took another week of HP coverage. A portable smear counter was set up in the pool area to facilitate the control of contamination. All contamination was successfully confined to the ribboned unloading area and no exposure in excess of administrative controls was received. However, samples of the overflow from the pool have increased in activity from background levels to 1,000 d/m/ml $\beta\gamma$.

DECONTAMINATION FACILITIES

The major items decontaminated, chemically cleaned or sandblasted during September include:

1. 6 casks
2. PM-2A tools and equipment
3. Milling machine parts

4. 2 FET pumps
5. EBOR oil pre-heater
6. Hot Shop equipment
7. MTR hot cell polishing equipment
8. 2 diesel engines

The large amounts of anti-c clothing used on the Aerojet General fuel transfer required a decontamination technician to spend considerable time working with clothing issue.

STEP

The SNAPTRAN-2 reactor components were assembled in the TAN-607 area and then moved to IET. Instrumentation of the core vessel and fixed beryllium surrounding the core was completed. Edgerton, Germeshausen and Grier, Inc., placed most of their equipment in position and were ready to participate in the electromagnetic interference tests.

SPERT

The major HP activities centered around SPERT IV where a capsule driver core was critically loaded for experimental purposes. Several nuclear tests were run which required HP surveillance. These static and low level tests did not result in significant radiation exposures to operating personnel and no airborne contamination evolved during these tests.

Routine cold operations continue at SPERT I, II and III which requires intermittent HP surveillance.

SPERT I building, deactivated, is being used as a preliminary test area for power burst testing using explosives to simulate capsule rupture. The SPERT I tank offers a convenient facility for the explosive tests being isolated from active reactor areas and from the control center.

Drilling and blasting for the excavation of the PBF facility by contractor personnel was begun the last week in September. In conjunction with this facility a meeting was held with ID to resolve the differences between PPCo and ID regarding the specifications for the health physics instrumentation. All major differences were resolved with some deletions in specifications. In order to retain features in certain instruments we were required to write a letter of justification to ID.

SNAPTRAN

Work on the SNAPTRAN grid has accelerated in preparation for the scheduled SNAP-2 destructive test scheduled for mid November. Progress during the past month includes labeling of pocket dosimeters, film badge holders and hi-vol filters. Tracerlab area monitor heads have been calibrated, mobile truck instrumentation has been renovated and favorable tests of aerial monitors (kites) have been made.

A new style fission gas sampler has been constructed for use on the SNAPTRAN grid. This new sampler consists of a large air-tight box containing a deflated balloon. The opening of the balloon is attached to an outside filtered opening in the box. The air inside the box will then be evacuated using a high volume air sampler attached to one end of the box. The resulting vacuum inside the box allows the fission gases to readily flow into the balloon past a one way check valve. This new sampler differs from previous ones in that the fission gases no longer pass through a pump before entering the balloon, thus eliminating plate out problems.

SPECIAL PROJECTS

A check of the existing wall shielding of the proposed LOFT high level counting room in TAN-607 was made. The check consisted of placing a 5 Ci cesium-137 source inside of the room and measuring the gamma flux penetrating the walls. The information obtained is being used to evaluate the necessary additional shielding required for the room.

The study of the evaporator system has continued. At present condensate from the evaporator flows through a two inch pipe to a receiver tank. The liquid in this tank is sampled periodically to determine if its activity is low enough to be dumped in the dry well. If the activity is too high the liquid is directed to the collecting tanks and reprocessed.

It was suggested that a monitoring device be attached to the line between the condenser and the receiving tank to give constant indication of the radioactive liquid entering the receiver. Thus the flow to the receiver could be stopped if the level became too high and the liquid already in the receiver could be dumped to the dry well. This would save unnecessary reprocessing which is quite costly.

A temporary radiation recording device was set up in the evaporator building. The device consisted of a GM probe taped to the outside of the pipe and shielded against background with lead sheet and lead wool. The probe was connected to a Technical Associates ratemeter and Devar recorder. The monitor was operated continuously between September 13 and October 1. The recorded results combined with samples taken from the receiver indicate that particulate matter in the liquid flowing through the line is the prime cause of the high radiation levels.

It was suggested that a filter be placed in the line between the condenser and the receiver. However, it appears that it would be more effective if a filtering system were placed prior to the evaporator itself. This would eliminate many problems in the entire system rather than at just one point.

RADIOLOGICAL ENGINEERING

A significant portion of the month was spent reviewing and discussing with the authors the addendum to the LOFT Preliminary Safety Analysis Report

(PSAR). The Radiological Engineering Group was represented at the preliminary review of the addendum held on September 23. The PSAR for the Power Burst F cility was also studied in preparation for the review by DRL and ACRS in early October.

The literature search and study was continued to determine acceptable guide lines for evaluating safety analysis reports (SAR). This effort includes the development of quick methods for determining the inventory of important fission products resulting from a postulated reactor operating history, as well as the doses at various distances downwind resulting from the release of this inventory. Some progress has been made on revising the cloud gamma dose and deposition dose equations used in conjunction with the RSAC computer code.

Permission was obtained and preparations were made to participate in the methyl iodide release planned by the AEC IDO. However, due to an unfortunate loss of the methyl iodide these preparations were not allowed to culminate.

The curie code which calculates the build up and decay of fission products resulting from the thermal fission of U^{235}, is being reviewed. Many of the fission product decay schemes and the radionuclide half lives are being changed to reflect data presented in recent publications.

This code is an integral part of the RSAC, Radiological Safety Analysis Computer Program, which will be used for reactor safety analysis when it is refined.

In addition, we will be receiving within six weeks, a revised Curie Code and a Dose Thunderhead program from the Argonne Computer Code Center which was developed by Atomics International. The dose code uses the fission product data generated by the Curie code to determine the dose to nine internal body organs and the GI tract due to inhalation of a portion of a radioactive cloud as it drifts by. The Thunderhead code used the fission product inventory to determine the external cloud gamma exposure dose to an individual. The combined Curie-Dose-Thunderhead program performs the same calculations as the RSAC code. A comparison will be made of their usefulness and accuracy.

SUMMARY OF ROUTINE WORK

Smears	2600
Direct reading dosimeters issued	35
Body fluid samples	
Routine	18
Special	0
Liquid samples	
Waste water	4
Radioactive shipments	
Off-site	7
On-site	91

Burial Ground	5
Laundry	8
Safe Work Permits	27
Beryllium analysis	0
Safety Meetings	1
Excess exposure requests	2
Whole body analysis	6
Green Tags	198

MAN HOUR TABULATION

EXEMPT	NONEXEMPT	TOTAL		EXEMPT	NONEXEMPT	TOTAL
Scheduled Hours				Actual Hours Worked		
1408	1936	3344		1167	1839	3006
Overtime				Absences		
4	99	135	S - 29		8	37
			SF - 0		20	20
			V - 152		88	240
			H - 64		88	152
			DF - 0		24	24
	TOTAL	3479			TOTAL	3479

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